

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 5, line 28, of the Substitute Specification with the following paragraph:

The sensing arrays 24, 26, as shown in Figure 6, receive optical power and produce optical signals via fiber optic cables 30 that extend between the flow meter 22 and instrumentation 100 residing on the platform 20 or at a remote location in communication with the platform 20. Optical fiber pressure sensors 32 within each sensing array 24, 26 may be connected individually to the platform instrumentation or may be multiplexed along one or more optical fibers using known techniques including, but not limited to, wavelength division multiplexing (WDM) and time division multiplexing (TDM). The sensors 32 of sensing arrays 24, 26 may be connected to one another in series or parallel. The optical signals produced by the sensing arrays 24, 26 provide information relating to the fluid flow characteristics within the pipe 12 (e.g., local flow disturbances, acoustic wave propagation within the flow, flow pressure magnitude and changes, etc.). Interpretation of the optical signals, which can be performed using methods well known in the art, enables the determination of the speed of sound (SOS) of the fluid mixture and the velocity of the fluid flow within the pipe 12. Once the SOS, the flow velocity, the pressure, and the temperature of the mixture are known, other desirable data, such as the phase fraction of the constituents within the mixture, can be determined. The optical signals from the sensing arrays 24, 26 may also be interpreted using the methods disclosed in the following U.S. ~~Patent applications~~ Patents, but are not limited to being used therewith: U.S. Patent Nos. 6,435,030 to Gysling et al.; 6,463,813 to Gysling; 6,354,147 to Gysling et al.; and 6,450,037 to McGuinn ~~application serial no. 09/105,534 ("Fluid Parameter Measurement in Pipes Using Acoustic Pressures," filed June 26, 1998), serial no. 09/344,070 ("Measurement of Propagating Acoustic Waves in Compliant Pipes," filed 25 June 1999), serial no. 09/344,069 ("Displacement Based Pressure Sensor Measuring Unsteady Pressure in a Pipe," filed 25 June 1999), serial no. 09/344,094 ("Fluid Parameter Measurement in Pipes Using Acoustic Pressures," filed 25 June 1999), and serial no. 09/344,093 ("Non Intrusive~~

~~Fiber Optic Pressure Sensor for Measuring Unsteady Pressures within a Pipe," filed 25 June 1999~~), all of which are hereby incorporated by reference. Figure 2 shows an exemplary embodiment of the present invention wherein the SOS sensing array 24 and the flow velocity sensing array 26 are positioned adjacent to one another on a common length of pipe 12. Further details of this embodiment are provided below, and Figures 3-5 diagrammatically illustrate sensing array embodiments and attributes that can be used with either or both sensing arrays 24, 26.

Please replace the paragraph beginning on page 8, line 33, of the Substitute Specification with the following paragraph:

In most embodiments, the optical pressure sensors 32 used in the SOS and flow velocity sensing arrays 24, 26 further include one or more optical reflective devices 46 disposed between coils 33 that are wavelength tunable. In a preferred embodiment, the optical reflective devices 46 are fiber Bragg gratings (FBGs). An FBG, as is known, reflects a predetermined wavelength band of light having a central peak reflection wavelength (λ_b) and passes the remaining wavelengths of the incident light (within a predetermined wavelength range). Accordingly, input light propagates along the cable 30 to the coils 33 and the FBGs 46 reflect particular wavelengths of light back along the cable 30. Experience teaches that in most applications there is advantage to placing an isolation pad between each optical reflective device and the outer surface of the pipe to accommodate pipe growth and/or vibrations. U.S. Patent No. 6,501,067 to Jones et al. application serial number 09/726,060, filed on November 20, 2000, discloses such an isolation pad and is hereby incorporated by reference.